

REMARKS

Status of claims

Claim 7 has been amended. Claims 7 and 9-18 are pending and under consideration. Claims 1-6, 8 and 19-54 have canceled previously. Claims 10 and 16 are canceled herein. Claims 7 and 9-18 have been rejected. No new matter is added.

Claim amendments

Claim 7 has been amended to overcome rejections under 35 U.S.C. § 112, second paragraph and rejections under 35 U.S.C. § 103 (a). Claim 7 has been amended to delete "pipette-based" to distinctly claim the subject matter, which Applicant regards as the invention. Claim 7 has further been amended as helpfully suggested by the examiner to restrict the claim to matter disclosed in the specification by including (a) "spaced 9 mm or 4.5 mm center to center to load multiple reagent samples and" to recite the distance between pipette tips; (b) "nanoliter" and "that has been loaded with microliter quantities of said analyte specific reagent" to recite the higher volumes spotted in the miniarray as compared to traditional microarrays; (c) "which is performed by applying an electromechanical force to the tips of said dispensers" to distinctly claim the method of dispensing the reagent on the miniarray substrate. Claims 10 and 16 are canceled herein as they repeat the subject matter included in newly amended claim 7. No new matter is added.

Rejections under 35 U.S.C. § 112

Claims 7 and 9-18 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Applicant respectfully traverses this rejection.

The examiner states that the words "pipette-based" has not been deleted at all the points where it appears in the claims as remarked by the Applicant in the response dated February 2, 2005. The Applicant has amended the claim7 to delete these words and the claims now correctly recite to subject matter pertaining to the invention. Accordingly, the Applicant respectfully requests that the rejection of claims 7 and 9-18 under 35 U.S.C. § 112, second paragraph, be withdrawn.

Rejections under 35 U.S.C. § 103

Claims 7, 9-10 and 12-18 are rejected under 35 U.S.C. 103 (a) as being unpatentable over **Little et al**, Anal. Chem. 1997, 69, 4540-46 in view of **Van Ness** (6, 248, 521). Applicant respectfully traverses this rejection.

Little et al. teaches the use of an Autodrop system from Microdrop GmbH (Norderstedt, Germany) to print miniature arrays for MALDI analysis. The Microdrop technology uses a glass capillary surrounded by a tubular piezo actuator to spot reagents on a suitable substrate. The dispensing end of this capillary is formed to a nozzle. When an appropriate voltage pulse is applied, the piezo actuator contracts and creates a pressure wave that causes motion of the reagent solution at the nozzle. This subsequently causes a small liquid column to leave the nozzle and form a droplet, which flies freely through the air and is deposited on the substrate. This system can dispense volumes from 30-500 picoliters.

The pipette tip based dispensing system developed by the inventor is fundamentally different from the Microdrop system. The present invention uses automated pipette tips to reliably deposit nanoliter volumes of analyte specific reagents on solid or membrane surface. The invention employs disposable pipette tips. The inventor also discloses the use of simple air-driven technology to spot samples. The pipette tip holders can be electromechanically activated to aspirate or dispense nanoliter or microliter quantities of reagent solution into or

out of the pipette tips. The invention also describes the use of syringe or vacuum pumps to vacuum in or pressure out the reagents.

In lieu of the above it is clear that the system required for making a miniature array as taught by **Little** is different from the Applicants technology of making a miniarray. **Little** discloses that the spot to spot variation is minimal using the Microdrop system as compared to manual pipetting. This is well known in the art that automated pipetting is better in terms of reproducibility as compared to manual pipetting. Inventors in general are motivated to devise new automated liquid dispensing systems. However this in no way provides the specific technical background for the Applicant's system. Also, the inventor provides for spots with a CTC of 1-3 mm and **Van Ness** teaches the presentation of spots with a CTC range of 25-500 μm . The CTC range proposed by **Van Ness** is geared more towards the preparation of microarrays using available standard techniques. Thus the teachings of **Little** and **Van Ness** together do not address the method of miniarray preparation as disclosed in the specification. Thus, the Examiner's argument that the inventor was motivated to device his system using **Little's** teachings in view of **Van Ness** is moot. Furthermore the Applicant has amended claim 7 as suggested by the Examiner in a facsimile transmission dated May 11 2005 to limit the claim to the subject matter disclosed in the specification. Accordingly, the Applicant respectfully requests that the rejection of claims 7, 9-10 and 12-18 under 35 U.S.C. 103 (a) be withdrawn.


Claim 11 is rejected under 35 U.S.C §103(a) as being unpatentable over **Little et. al.** in view of **Van Ness** and further in view of **Lange**. Applicant respectfully traverses this rejection.

The Applicant maintains that the method as described by **Little et al.** provides no motivation for devising the pipette tip based liquid dispenser disclosed in the present invention. In view of this, the inclusion of the disposable pipette as disclosed by **Lange** when combined with **Little's** teachings does not render claim 11 obvious. Accordingly, Applicant requests that the rejection of claim 11 under 35 U.S.C. §. 103 (a) be withdrawn.

This is intended to be a complete response to the Office Action mailed May 18, 2005. Applicant submits that claims 7, 9, 11-15 and 17-18 are in condition for allowance. If any issues remain outstanding, the Examiner is respectfully requested to telephone the undersigned attorney of record for immediate resolution. Please debit any insufficiency of fees from Deposit Account No. 07-1185 upon which the undersigned is allowed to draw.

Respectfully submitted,

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